Litecrete

leads the lightweight revolution

concreteinnovation

Litecrete lightweight precast concrete panels, made from Golden Bay cement and pumice aggregate, are leading the way in precast development.

Philip Archer, Business Development Manager at Litecrete (NZ) Ltd, explains: "Traditionally concrete is made using crushed rock, cement and water. We're using pumice instead of crushed rock. That makes the panel half the weight of normal precast and also provides added insulation, very important these days. By comparison, normal precast concrete would have to be at least four times as thick to get the same insulation value we achieve with our Litecrete product."

Litecrete (NZ) Ltd is a wholly-owned subsidiary of Wilco Precast Ltd, a family-owned company with a 48-year tradition of manufacturing precast concrete in Auckland. Wilco is based in a state-of-the-art manufacturing facility at Papakura, South Auckland.

"The Litecrete product was developed over a five-year period as the company trialed various options for making lightweight concrete," says Philip. "There are other methods, for example, mixing aluminium powder with cement and water to make aerated concrete. Aluminium powder causes the cement/water mix to expand, similar to yeast in a bread mix, and generates millions of tiny voids which provide insulation. The volatility of the powder, which has now been banned in most countries, and our inability to manufacture large, stable precast concrete panels, steered us toward the use of pumice. We can make Litecrete panels up to 7 metres long by 3 metres wide. The air cells in the pumice give Litecrete its exceptional thermal resistant properties.

Philip says the 150 mm thick wall panels meet the current Solid Construction Building Code requirements for thermal resistance (Climate Zones and 2). "The recent changes to H1 require us to manufacture thicker panels to comply with the new Code. Fire resistance exceeds four hours and we can also offer an acoustic system that achieves STC60."

While the Litecrete panels were initially developed for the residential market, they are suitable for most precast applications and are being used more and more in commercial construction.

"Considerable savings can be made if Litecrete is considered at the design stage," says Philip. "With the construction industry becoming more competitive, profit margins shrinking and construction schedules accelerating, Litecrete is an increasingly attractive, cost-effective building material. It can provide overall structural economies by reducing the mass that must be considered in seismic design and the dead load transmitted to foundations and superstructure members."

The combination of pumice and cement, reinforcing steel and polypropylene fibre, gives Litecrete its light weight and its unique strength to weight ratio. The panels are manufactured under strict quality-controlled conditions before being shipped to the site and installed rapidly. Panels for a typical single-storey house can be up in two to three days.

While using pumice for aggregate is an innovative concept in the 21st century, it is not an entirely new one. Two of Rome's most famous tourist attractions, the Coliseum and the Pantheon, were constructed partly from crushed lava, crushed brick and pumice aggregates more than 2000 years ago during the ancient Roman Empire.

With abundant supplies of pumice in the upper North Island, nil on-site waste due to precast panels, and a light weight that allows twice the volume to be trucked compared to normal precast, environmental sustainability is another strong selling point for Litecrete.

However, the lack of availability of pumice in the South Island and the prohibitive cost of shipping it in, means that Litecrete is not available down south.

Currently, only about six percent of homes are constructed in concrete or masonry, yet despite its perception as a premium building product, Philip reports a growing interest in the use of concrete in general and Litecrete panels in particular. A recently completed house at Simpson's Beach, Whitianga, is almost entirely built out of concrete. The floor slab is normal ready-mix concrete; the walls, mid-floor panels and the roofing panels are all made with Litecrete lightweight precast. The only timber inside the house is on the stair treads.

"The key is to educate people about concrete homes because the benefits are many," he says. "The thermal mass provided by concrete means that swings in temperature from outside to inside are minimised; the house is very quiet between floors and between rooms; it creates a very good, dry environment for people with breathing problems such as asthma. Fire and moisture resistance, rot resistance, cost-savings through energy efficiency and very low maintenance, plus the longevity of a Litecrete home – what more could you want?"

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